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THE
AMERICAN COLLEGE
IN RELATION TO
LIBERAL EDUCATION.

THE INAUGURAL ADDRESS
OF
PRESIDENT DAVID J. HILL, LL.D.

READ BEFORE THE ALUMNI AND FRIENDS OF THE
UNIVERSITY OF ROCHESTER,
JUNE 19, 1889.

SECOND EDITION.

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the Univ. of Rochester

THE INAUGURAL ADDRESS.

The University of Rochester had its beginning in a liberal and progressive apprehension of educational needs. It was distinctly seen by its founders that an atmosphere of human activity and social refinement is needed to stimulate intellectual culture and invigorate moral character; and, accordingly, this beautiful and prosperous city, which has since become even more conspicuously a centre of elevating influences, was chosen as its seat. Far enough West to feel the thrill of enterprise and to share in the optimistic hopes of Western life without being subject to its provincialisms; far enough East to enjoy the benefits of our oldest American civilization without being influenced by its archaic customs and colonial traditions—Rochester, on the principal highway between the great lakes and the Atlantic, satisfies all the conditions of an ideal university town.

The company of men who have shaped the destinies of this institution was originally formed by the selective power of a common conviction that a great opportunity creates a great obligation; and the corporation has since been recruited from among those who shared in this conviction. The not inconsiderable resources which years of generosity and prudence have accumulated are mainly the continued tokens of the satisfaction and perseverance with which the fathers of the enterprise themselves and their colleagues in munificence have regarded their undertaking. Their first act of wisdom was the choice of a president whose magnificent manhood

alone would have given the university a national reputation, and whose intelligence, patience and self-devotion have transferred the greatness of the man to the institution which he served, imparting to it not only celebrity, but an intrinsic excellence that everywhere commands respect.

Always distinctively and emphatically Christian in its motives and influence, the university has shown no narrowness in its choice and treatment of the able professors, often brilliant scholars, who have constituted its devoted faculty.

The fruits of this progressive and generous policy have been abundant. Young men of superior native endowments in every part of our land have felt the power of its attraction, and have filled the class-rooms of the university as rapidly as it has been able to make provision for their needs. A body of alumni, characterized in a singular manner by cleanliness, chivalry, scholarship and success, honors and adorns the widely diversified vocations which its representatives have chosen, and has furnished shining ornaments to science, letters, politics, journalism, law and medicine, and to that noblest of all human callings—the Christian ministry. The undergraduates also are not without traits which reflect credit upon their domestic antecedents, their social relations, their collegiate training and themselves; for I was told at the American College in Rome, by the Bishop of Rochester, that the students of the university are notably distinguished for good morals, good order and good scholarship. How far all this is owing to the presence and influence of another institution, whose sole function is to train men for leadership in spiritual life, I do not know; but I am certain that the social atmosphere is sweetened and rendered more invigorating by the scholarly president and professors of the Theological Seminary.

In coming to the service of the University of Rochester, I trust that the fact of my not having the honor to be an alum-

nus may not debar me from that sense of perfect fellowship which is everywhere a prime condition of success. In endeavoring to establish some form of relationship, I have discovered that, although I am not a son, the university and I are twins; chronologically, at least, for we saw the light in the same year.

An inaugural address is expected to be, in some sense, a kind of confession of faith, or declaration of principles, which may serve as a programme of expectations. Such addresses on induction into political office usually consist of an elaborate formulation of the doctrines of the victorious party, and their contents may be predicted with the certainty that they will contain nothing new but the phraseology. But happily, in this case, there have been no parties, no opposition of principles, and no partisan triumph. An invitation to assist in a noble and established work has been extended and accepted, a special leave of absence has been granted and enjoyed, and now the active performance of duty begins. The spirit in which this responsibility is assumed will soon appear; and it would be strange, indeed, if it were not one of gratitude, confidence, enthusiasm and consecration—of gratitude, because of the generosity of the corporation in granting a year of absence, and because of the kindness of President Anderson and the faculty in carrying on the administration and instruction of the college without my aid; of confidence, because of the excellent condition of the institution in every respect; of enthusiasm, because of the rich and ripe possibilities of growth and progress here; and of consecration, because of the intrinsic nobility of a vocation whose principal end is the development of a high type of manhood.

I have never realized so intensely my birthright as an American citizen and my privileges as an American teacher as when surveying my country and its prospects from a great

distance, and in comparison with the institutions and possibilities of other lands. The perspective is more just, and the proportions are more magnificent. I may truly say that, from this point of view, the work to be done at Rochester has seemed to me more attractive and hopeful than ever before, and I have seen little really to be desired that might not be easily realized from the development of seeds already planted here.

The founders of the university seem to have had from the beginning a clear conception of the difference between collegiate and university work, and to have adhered to it with unswerving loyalty. It seems useful to formulate and express, from time to time, that difference as affected by the growth of institutions and of opinion. I have, therefore, chosen as the theme of my address, "The American college in relation to liberal education."

THE SPECIALIZATION OF UNIVERSITIES.

We have thrust upon us from all sides subjective ideals of what a university and a college should be. A little history is worth a great deal of definition, because definition may be subjective and ideal, and history is objective and actual. History writes itself in existing institutions more plainly than in treatises. If you visit fifty European universities, you will find an impressive illustration of this. In forty of the fifty university towns, on inquiring for the university, you will be directed to a structure containing a group of lecture-rooms and administrative offices, of which our "Anderson Hall" might convey a typical idea. Sometimes, as at Göttingen and Strassburg, these are of recent construction, replacing older buildings. Sometimes, as at Berlin and Bonn, they are old royal or ducal palaces, converted to educational uses. Sometimes, as at Würzburg and Naples, they are dismantled

monasteries. But everywhere from Berlin to Athens and from Athens to Salamanca, with the exception of the English universities (which are either groups of colleges, as at Oxford and Cambridge, or examining institutions, as at London), whatever else you find or miss, you come upon these ancient nuclei, or centres of life, of the universities. But, wherever large numbers of students are gathered—that is, wherever the universities are really alive—you find grouped about these nuclei handsome, costly, new buildings, often perfect palaces in beauty, devoted to special purposes, such as clinics, museums, laboratories, and the like. Sometimes, as at Tübingen and Strassburg, you find not only a large and handsome structure devoted to chemistry, but another consecrated to such a special branch as physiological chemistry. At all the great centres the old nuclei of the universities are overshadowed by the newer structures as places of real university work. The Italian government is expending millions of lire at Turin and Naples in the erection of magnificent new buildings, with a separate one for every important division of science. An archæologist, finding such a significant object lesson in a buried city, would at once infer, from the greater age of the nuclei, that there was a time when a university required only a few lecture-rooms, and that it had afterwards completely outgrown these limits.

If now you inquire into the history of the internal growth of the university, you find that the tendency for 200 years has been to specialize instruction, but that specialization has proceeded with augmented velocity for the last half century. There was a time when the work of a university was called “*Studium generale*.” It might now be called a “*Studium speciale*.” The time was when the aim of the “philosophical faculty” was simply to prepare the students for professional study in the other three departments—those of “theology,” “law,” and “medicine.” Then “philosophy” was a tissue of

dogmas delivered in Latin lectures to very young students by men of authority, who disdained all experiment and disliked simplification. In those days, when the soul was serenely localized in the pineal gland, when the circulation of the blood was unknown, when the rising of water in a pump was attributed to "nature's abhorrence of a vacuum," a few plain lecture-rooms constituted a very fair outfit for a university. But, as "philosophy" conceived a new regard for nature and became more realistic, objective and inductive, the old "philosophical faculty" was transformed into a group of special schools. Until this change occurred, the work of "liberal" education was the function of the "philosophical faculty" of the university. By the change, "liberal" education was transferred, in Germany, to the *gymnasium*; in France, to the *Lycée*; and the university became, is, and henceforth will be even more emphatically, the place of "special" and "professional" education. This is a natural development which must be followed wherever knowledge advances.

OUR EDUCATIONAL SYSTEM.

If now we attempt to classify the forms and institutions of education among ourselves, we fall upon a very complicated problem. This is caused in part by the diversity of human aims and the complexity of human pursuits, in part by the want of unity in our educational organization. There are, from one point of view, as many forms of education as there are varieties of men in the commonwealth. Educational organization aims to give some system and classification to these forms. Leaving out of account, simply as unnecessary to my present purpose, the important branch of manual training (so nobly recognized and provided for by the "Pratt Institute" in Brooklyn), I shall name only the four forms of

education which are in essential correlation with one another as grades of a continuous mental development.

First, all men and women, especially in a republic, require a knowledge of the simple rudiments, such as reading, writing, arithmetic and geography. These elements are imparted by the common school, are universally essential to the well-being of the people and the state, and constitute the substance of a primary or elementary education.

Second, a considerable number of persons contemplating business, teaching, the care of property, or aspiring after some induction into the superior circles of life and thought for their own sake, require a more extended knowledge, but still limited both in the number of topics and depth of attainment, such as is imparted by our high schools, normal schools and academies. This may be called, by names as vague as the thing signified, secondary or academic education.

Third, a still smaller number of persons seek a preparation for large personal or professional development, sometimes for the mere love of knowledge, sometimes as an introduction to more special pursuits, comprising a generous outfit of intellectual attainment, with the double view of maturing and invigorating the powers of the mind and of supplying it with the amplest furniture of general knowledge. Such an education is imparted in our country by the college, as it is in Germany by the *gymnasium*, and in France by the *lycée*, and may be called a liberal education.

Fourth, the modern subdivision of labor, the minute ramifications of scientific investigation, and the accumulation of detailed knowledge, render it necessary that those aspiring to eminence in any of the professions, especially to influence or authority as teachers or investigators, should devote themselves exclusively to the study of certain particular branches under the guidance of eminent specialists. This is done in professional schools, schools of technology, or universities, and may be called professional or special education.

THE DANGERS OF IMMATURE SPECIALISM.

The necessity of special education is now so evident that it is likely to receive much attention. Many minds are reaching out toward the establishment of universities in the proper sense. There is danger, however, to culture, to society, to the professions and to science itself, arising from a too intensely concentrated specialism, and even more directly from a crude and immature specialism, which is now noticed and lamented by thoughtful observers. We are beginning to see, even in our colleges, professors who are so narrowly and fatally specialized that they are wholly out of sympathy with the general culture which the college aims to impart. It is estimated that only about five per cent. of the practising physicians in the United States are men of liberal education. The legal profession, probably, includes a larger proportion of liberally trained men, and the ministry of the Gospel would also, perhaps, make a better showing, but general indications, on the whole more significant than statistics, plainly indicate the wide prevalence of defective culture, and frequently the absolute want of culture, among our professional men.

The principal cause of this unfortunate fact is, of course, the haste among our young men to obtain paying positions, which is accelerated in our country by more numerous and more powerful motives and is confronted with fewer and less formidable obstructions than in any European country; but this prime cause, which should have been resisted and neutralized by our institutions of higher learning, has been weakly met and openly sanctioned by many of them. This has been done conspicuously in four ways:—first, by throwing open the professional and special courses to men of defective general culture, with no preparation for university work, such as is insisted upon in Germany, where every candidate for university stand-

ing is required to be an "Abiturient" from a gymnasium or real-gymnasium; second, by the introduction into some of our colleges of university studies and methods without a corresponding elevation of the standard of admission, in the hope that the name "university" might thus be justified; third, by conveying to students the impression that "liberal" culture is no real or definable thing, but that any scheme of study, arranged and followed at the learner's option, is as good as another, if only the four years are spent at the college and the term bills are promptly paid; and, fourth, by the shameful competition among rival colleges in diluting the courses of study to suit the callow intellectual estimates and even the cerebral weakness of undergraduates, really forming the curriculum on the principle of the market rather than on the principle of scholarship, literally and openly rivaling one another in offering "attractions" hardly more dignified than the "chromos" of struggling newspapers! The results of this are that, while most of our colleges wish to be thought universities, most of our universities are merely colleges; it is possible to be graduated in utter ignorance of whole sections of knowledge once considered indispensable to a liberal education; and the degree of Bachelor of Arts from an American college has an ambiguity that places it in peril of contempt at home and of ridicule abroad.

It gives me great pleasure to believe that the University of Rochester, while enjoying the charter privilege of becoming a "university" in the proper sense, has not sinned in any of these respects, and has honestly been, and professed to be what its resources have justified—a "college," in the true and historic acceptation of the word. If it should ultimately expand to the full limits of its prerogatives, I trust it will do so by a legitimate internal growth, and not by a mere vote of the corporation.

THE IDEA AND AIM OF LIBERAL EDUCATION.

The pretense that is advanced to justify the melancholy history of rivalry and confusion in our educational system is, that the idea of a "liberal" education is essentially a vague, uncertain and undefinable idea. I propose to show that, while this idea is a progressive one, and, therefore, admits of amplification from time to time, it is, on the other hand, a very clear certain and definable idea.

All education consists in the formation of certain habitudes, or predispositions for particular kinds of action. A human being before his education begins is neither a complex fabric of innate ideas, as Descartes taught, nor a *tabula rasa*, or uninscribed tablet, as John Locke contended; but a psycho-physical organism with certain inherited activities and the capacity to acquire new ones. I say a "psycho-physical organism;" for in the concrete conditions in which we find ourselves, there is no *actual* separation between the psychical and the physical factors of life. We cannot reach the mind except through the body, and we cannot touch the body without affecting the mind.

The process of education is the reduction of a simple psycho-physical act to a perfect automatism. Take the process of learning to read as a typical one. The child learns the individual letters by frequent repetition. Then he associates their combination into syllables with simple ideas. Next he grasps the meaning of entire words without particular consciousness of the individual letters. Finally he gathers the meaning from a paragraph at a glance without being conscious of its separate words. In like manner the novice is conscious of making each figure in a mathematical operation ; the advanced student has reduced the making of figures to an unconscious action, and merely interprets them ; the accomplished mathematician applies his thought to the abstract relations of his

problem only, and uses his formulas almost as unconsciously as a master pianist touches the keys of his instrument with infallible fingers, while his soul is wholly occupied with the harmony. The law of all education is the progressive translation of imperfect and incomplete conscious acts into the fixed determinations of a mechanical automatism.

The uneducated man finds himself incapable of performing an act at a moment when it should be spontaneous. The half-trained specialist is in a similar situation when he finds himself unable to read an important foreign article on his specialty, or to apply a mathematical or scientific principle which he has omitted to learn. He suddenly discovers that some things are necessary which he has neglected or could not acquire, and feels in his limitations that he is not a symmetrically educated man. It is not, then, so difficult to form a clear idea of a "liberal" education. To deserve the qualification "liberal," training must include all that is essential to a subsequently self-directed human development, which, in time, might be made complete by the scholar's own activity along special lines of study. Liberal education does not aim to form the specialist, but to prepare one to be a specialist by making him, in a large sense, an educated man.

HISTORIC AND MODERN CONCEPTIONS.

This is neither an arbitrary nor a new conception, but the tried and historic one. The "trivium" and "quadrivium" of the mediæval schools aimed to realize it, and measurably did so in relation to the fund of ideas which men then possessed. The encyclopædia of knowledge has, indeed, outgrown the possibility of imparting it within any practicable limits of general instruction, but the elaboration of concepts and the improvement of pedagogical methods have facilitated the processes of intellectual growth in even greater

proportion. The endeavor of the educational reformers of the period of the Revival of Letters to inculcate the "humanities," was an attempt to implant in the individual the rudiments, at least, of the knowledge and culture which had been attained by the race. The educational reformers of the next great epoch of intellectual progress, the period of Scientific Discovery, believed that they had found in the study of nature by the methods of observation and induction a richer vein of truth than that afforded by the traditional knowledge and personal wisdom treasured in ancient classical literature; and, therefore, demanded for the study of nature a larger place than the humanists were willing to grant. The conflict ended in the triumph of the naturalists, and the penalty of the opposition has been a war on the classics which has become a tradition of the narrower sectarians of science.

The best type of modern culture, however, accepting every good thing where it is found, duly recognizes, on the one hand, the value of the human thought embodied in those works which men have agreed to call "classic;" and, on the other hand, the worth of those facts and principles which more recent efforts of the human mind have been able to extract from the investigation of nature. Thus, our best teachers have learned to blend our two inheritances, the human and the natural, and in this union of the "humanities" and the "sciences" they give us the benefit of our double birthright as heirs of all the ages and interpreters of nature. In the present age, therefore, no man is "liberally" educated who has not acquired the ability to put himself in possession of the best results of human thought and experience, and to employ those methods by which truth is discovered and the sum of knowledge is augmented. Whether specialist or not, any man who has acquired that ability and is fitted to take his place in the social system as a participant in the world's best thought, and to profit

by the attainments of his race in his own person, is a "liberally educated man ;" and this he needs to be as a specialist in whatever branch. Although such "liberal" training may, with difficulty, be obtained outside of the college, it is the proper and particular function of the college to impart it. The university should require it as a condition of entrance and supplement it with more special work.

THE ESSENTIALS OF A LIBERAL EDUCATION.

If now we ask, what are the essential constituents of a "liberal" education, it is evident that it includes (1) certain attainments of knowledge, and (2) certain qualifications for conduct.

Three distinct accomplishments are necessary in the sphere of knowledge : (1) knowledge of how to reach and employ the acquisitions already made—that is, an adequate instrumental equipment; (2) familiarity with the most important general facts and principles of accepted science—that is, knowledge of the positive results of the substantive sciences, as distinguished from the mere guesses, theories and opinions of men ; and (3) the master-keys of the order and progress of events in the natural and the moral world—that is, a grasp of the philosophical principles which underlie and explain the phenomena of history and of life.

This is, no doubt, a broad and high ideal of education, and one which, if accepted, would compel us to regard as failures many of the attempts made both to attain and to impart it ; but we should never allow our pity for failure to bewilder our conception of success, and least of all in the spheres of culture and morals. A more detailed, yet cursory, examination of the three elements which have been named will convince us that they are really indispensable to an education claiming to be, in any just sense, "liberal."

THE STUDY OF LANGUAGE AND LITERATURE.

The instrumental equipment of a trained scholar consists of a competent knowledge of language and mathematics. Language is the instrument of thought, of record, and of communication. It is through its mechanism that reason produces its results, and in its forms that revelation embodies its substance. To be wholly ignorant of it is to be excluded from the whole empire of thought, to be isolated from all the achievements of humanity, to be condemned to the companionship of dumb animals, whose life revolves in the closed circle of bodily sensations. All this is evident. But is it not a necessary corollary that, in proportion as one is master of this great instrument, he enters more deeply into vital and sympathetic relations with the currents of human activity and experience, as one who increases the magnifying power of a lens penetrates farther and farther into a world otherwise invisible? And here it must be remembered that language connects us with the past as instruments of precision open to us the present. Every word is the broken echo of ancestral voices, and even our written characters are the battered and mutilated remnants of Egyptian hieroglyphics.

But to what extent must one be a linguist in order to be a "liberally" educated man? It is hardly worth saying that one making this pretension must be a master of the clear, idiomatic use of his mother tongue. But is this a "liberal" allowance? Certainly the scholar requires as much use of languages as is needful for free, unhesitating research in the world's great repositories of knowledge, and for the appreciation and appropriation of their contents. To say that so much is not universally necessary is simply to say that not all men need to be "liberally" educated, which is too plain to be controverted. But the "scholar" certainly needs this.

Experience shows that ability to read ordinary Latin at sight is absolutely essential. All the Greek he can learn is likely to prove valuable. Whoever is wholly ignorant of either will have occasion to lament bitterly the illiberality of his education long before he has finished even elementary studies. But what shall be said of the tongues of those great modern nations, Germany, France and Italy, that are daily adding so much to the sum of human knowledge? The scholar who depends upon translations alone will find himself five or ten years behind his professional compeers who read foreign languages. The amount of time and labor required for a reading knowledge of two or three modern languages is so small that a young man aiming at a "liberal" education makes a mistake if he does not acquire it, and a fair speaking knowledge of at least one.

The claims of linguistic study are easily ridiculed for the reason that the languages are, after all, mainly the instruments of learning rather than the substance of knowledge itself. It is easy to sneer at learning several ways to express a thought without having any thought worth expressing, but the instrumental character of language is the very quality that makes the study of it so valuable, for it is precisely the use of an instrument rather than the mere apprehension of a fact that ever gives the most perfect discipline. Language is a tool without which absolutely no mental progress ever has been or can be made. It furnishes that "mould of doctrine" without which truth cannot even be stated. An investigator without its aid would simply experience sensations which he could not formulate. But without it there would be no investigator. The branches of the human race which have not first developed a rich and copious language have remained intellectually in a savage or barbarous condition. Language is not only an instrument of thought, it provokes and stimulates thought. It creates in the brain the need of some substance of knowledge to fill the forms of its own categories. The questions of

scholasticism preconditioned and necessitated the answers of modern science by revealing great chasms of ignorance which discovery was thus prompted to fill. A physiologist would say, the motions of the tongue have fabricated motor centres in the brain, whence have emanated the questioning touches of the hand and glances of the eye to which all experimental science is the answer. Speech is not identical with reason, as Max Müller teaches, nor is it the parent of reason, but it has made of the brain a mechanism without which reason would be helpless in the grasp of mere sensation. What has built the race will build the individual, and the mastery of language is the first step in the development of both.

THE STUDY OF MATHEMATICS.

The kinship between language and mathematics is very close. The first man who succeeded in giving a distinct name to each of his fingers, and then in abstracting those names, was the father of arithmetic and the inventor of the decimal system. Mathematics is a language refined and purified, the vernacular of pure reason, from whose symbols all equivocation and ambiguity have been eliminated. It is the instrument of all the "exact" sciences, and of nearly every form of investigation or calculation that ventures to claim precision. It deals not with things which are individual and concrete, but with relations which are universal and abstract. It carries us back of creation into the processes which antedate the formation of a cosmos, and furnishes the proportions and harmonies which render it a rational system. Space and time are the forms which it professes to analyze. It is, therefore, the most ideal and the most rational of all the branches of knowledge. It is based on the essential and necessary constitution of things, and knows no probabilities or accidents. It elevates the mind above the contingencies of

chance. It moves along the inflexible tracks of the rational imperative. It brings us nearest to that intuition of the structural laws of all reality with which the divine mind must contemplate nature. For these reasons it is the indispensable instrument both of the highest intellectual discipline and of all real demonstration.

How far is mathematical study, then, to be insisted upon as necessary to a "liberal" education? Certainly no education can be called "liberal" which has not enabled the recipient of it to perceive the mathematical necessity that runs through all natural relations, and to make those calculations which are needed in the exact sciences. How far this would carry us it is difficult, in a general discourse, to indicate. The direction is clearly right, and hence there must be good reasons to justify a halt before the whole range of mathematical study is completed. Such reasons are only too easily found in the claims of other branches, and in the resources of the student. We may be certain, however, that the more loose and confused the candidate's thinking, and the more mercurial his character, the more he needs the rigorous discipline of mathematical training. A safe and useful prescription, therefore, would be: "Administer mathematics in large doses in proportion to the learner's disposition to be vague or conceited." It is with well-accredited wisdom that our best colleges have confined the students during the first two years of their course of training almost exclusively to linguistic and mathematical studies, on the sound principle that these are the great instruments of all scholarly and scientific attainment, and that the first necessity of a good workman is a perfect mastery of his tools.

THE STUDY OF THE SCIENCES.

After the mastery of the tools of scholarship, a "liberal" education demands some knowledge of substantive science. There are two great divisions of science, because there are two great orders of reality, the natural and the moral. The former deals with that circle of physical processes which form the system of nature, and includes such special sciences as chemistry, physics, physiology, biology, geology and astronomy. The latter deals with the phenomena of the moral world, or what might be termed the human world, that is, the phenomena that occur because of the presence of man as an intellectual and volitional force, forming and governing societies, unfolding civil policies, developing arts, creating institutions, formulating creeds, analyzing the process of his own thought, examining the springs and capacities of his own nature, and throwing into the stream of historic movement the explosive and propulsive influence of his ideas—thus producing such sciences as psychology, logic, æsthetics, ethics, economics, politics and sociology, with the human formulation of that onward movement itself, man's statement of the divine logic of events which we call history.

It matters little under what rubrics these classes of facts are grouped, if only all the data are somehow included, and if any one should object to my classification, I should not do battle to defend it, but ask for a better grouping. What I wish to insist upon is, that the substance of science, in its elements at least, should constitute a part of a "liberal" education, and that it should not be confined to the merely instrumental studies to which the ancient curriculum was mainly limited; that a "liberally" educated man must really *know* something, as well as be capable of something, in the sphere of fact. It is this that characterizes the modern man

as distinguished from the mediæval man, and it must also characterize the modern college. Our republican institutions assume such knowledge, to some extent, in every citizen, while the monarchical theory assumed and cultivated popular ignorance. In our day every educated man should know what the essential conditions of independent, self-respecting life are, what to expect from nature and society, and what to expect from himself, how he is governed, and what his duties are as a possessor of political sovereignty. The superimposed planes of knowledge have risen proportionally. The world wants no more blind leaders of the blind, and will henceforth refuse to accept as guides those who are no better informed than the masses.

No one can read the history of the development of the sciences during the last half century without perceiving that the college must either greatly improve its plan of work or must fail to do for the men of this time what it did for the men of that earlier day, in relation to the whole mass of knowledge. The growth of science has necessitated a great revolution in pedagogical methods. It is now impossible to teach the natural sciences, even in their elements, by the use of text-books alone. A more rapid, vivid and spectacular method has become necessary. We do not teach the sciences primarily to discipline the mind, but to fill a mind already disciplined. A fact is never so clearly apprehended as when it appeals to the senses. Hence a direct, intuitive method has commended itself wherever practicable; and, in truth, is necessary when extensive knowledge of detail and precise distinctness of impression are demanded, as they are in all the natural sciences when pursued with any serious purpose. The new method substitutes the direct study of things, under enlightened guidance, for the study of verbal descriptions of things and abstract statements concerning them. Thousands of youth have studied chemistry without ever touching a test-

tube, physics, without ever seeing an air-pump, and astronomy without ever looking through a telescope. A professor of the ancient type maintained in my presence that this is a great advantage, like the study of geometry without figures, because it invigorates imagination. It is an invigoration of stupidity and conceit, sealing the mind to reality by substituting subjective fancies for experimental proofs, and the pretense of knowing for clear ideas. Its influence upon the character is as pernicious as its effects upon the mind, for it weakens the reverence for truth and engenders the habit of mental trifling. A great pedagogical reform has been forced upon us by the inefficiency of these mediæval methods. Its main principle is that we do not acquire knowledge most rapidly, clearly, and certainly by the passive reception of formulas, but by an interested self-activity in testing the truth for ourselves. More simply, knowing is an act, and certainty comes from our having performed it. When we have done something to an object, we are sure that it belongs to the real as well as to the ideal order. Observation, experiment, verification—these are the processes that transmute hypothesis into certainty.

The growth of the sciences and the reform in the method of teaching them has had two important results for the development of colleges. One is that a greatly increased personal force has become necessary to teach these branches in any really honest and effective manner, because no one man, however capable, can keep himself technically abreast of any considerable number of special sciences, or has versatility enough to teach all of them equally well. No teaching is worth much without enthusiasm, and enthusiasm is generated only by concentrating interest at a focal point. It has been poetically said, "You can have a college anywhere, if you have a Mark Hopkins at one end of a pine log, and a James A. Garfield at the other!" Without controverting a sentiment so lofty, and with a homely truth at the heart of it, too, I am

certain that, if living, Mark Hopkins would not wish to "keep college" in this primitive fashion, and that James A. Garfield would soon take a vacation. Not only a great increase in the personal force, but immensely multiplied and amplified means of instruction are demanded to make plain to beginners what is now known in the branches essential to a "liberal" education. Museums, laboratories and apparatus are now indispensable to respectable collegiate instruction, which twenty years ago were not required even by the universities for such work as they were then prepared to undertake.

If the assumption is correct that an elementary knowledge of the sciences is an essential part of a "liberal training," it is certain that no institution is fitted to impart it, or can honestly undertake it, unless it is richly provided with specialized instructors, and amply supplied with the materials of illustration and experiment. The pressure of the sciences upon the brief time that can be devoted to them in any practicable scheme of study is such that it creates one of the most serious and perplexing problems of contemporary college management. There are but two solutions of the problem. One is, to begin specialization very early in the course, without any attempt to compass a general knowledge of the leading sciences. This is to confess that "liberal" education has become practically impossible, that it must henceforth give place to "special" education, that knowledge has completely outgrown the powers of personal assimilation, and that we must content ourselves with a few scraps even of the rudiments. The other solution is, to provide so many well-trained instructors and such splendid facilities for making great principles plain in a short time, by effective methods and with economy of the student's powers, that all the great principles of science can be presented in the collegiate curriculum. This, I believe, will be the policy of the institutions destined to survive as colleges, but it will be a costly one. The incapable and impecunious

institutions must fall to the relative rank of academies, in which, perhaps, the first two years of a collegiate course may be fairly well completed.

THE STUDY OF PHILOSOPHY.

In addition to what I have called the "instrumental" and the "substantive" elements of a "liberal" education, there is a third, which might be designated as the interpretative. The human mind is so constituted that it demands to know the connections between facts and the place of particular groups of facts in the whole scheme of existence. This is the philosophical instinct. Every plan of "liberal" education has given some place to philosophy and has usually offered some outline of the history of philosophy. The need of every generation for such a coördination of ideas as its instructors may be able to present will, doubtless, continue to render necessary some attempts to satisfy it; and yet, it must be admitted, that personality has here a larger scope than in any of the other branches of study. Perhaps for this very reason it is desirable to make this class of studies prominent in the collegiate course, for the student, at this stage of his development, needs the impress of a strong personality upon his life and mind. How memorable and valuable to hundreds of young men has been the personal influence of such teachers—not to mention others—as Francis Wayland and Martin B. Anderson, whose great manhood has left more traces upon the intellectual and moral character of students than any literature or any science. As long as philosophy retains its primitive meaning, "the love of wisdom" (which, indeed, it has so often lost), the personality of the teacher will be more important than the system taught, and it can never be safely surrendered to the dominion of the dreamer or the perversion of the charlatan.

A true philosophy makes no other assumptions than those demanded by other sciences—that an order of reality exists and that it is intelligible. It is, in truth, only the science of sciences, and must assume that what any line of investigation affords of verified fact has relation to every other form of truth—that each isolated part of knowledge has relation to a higher whole. As every science assumes the coherence and harmony of the facts revealed by the separate senses, so philosophy assumes the coherence and harmony of all the revelations of the separate sciences. Only thus can it awaken the interest and command the respect of minds familiar with the methods and confident of the results of scientific investigation. Only thus can it maintain its primacy in the hierarchy of organized knowledge and lend its aid to the isolated workers who need its inspiration. To say that the days of philosophy are ended is to say that men can discover no meaning in existence—a judgment which would need only to be accepted in order to paralyze all rational activity and to destroy all strictly scientific impulse. We have only to analyze the process of scientific procedure itself to see that certain fundamental assumptions are common to all the positive sciences. It is the business of philosophy to formulate and interpret the function of scientific thought and thus to unify the intellectual life of man by an exposition of its necessary principles.

The true task of philosophy is, then, not so much to account for reality as to interpret it; not so much to retrace phenomena to their causes, which often lie beyond our reach, as to find in them their meaning. The possibility of philosophy depends upon the existence of such a meaning. Assuming that it can be found, we must look for it, not in the lowest but in the highest forms of being; not in hypothetical atoms or abstract forces, but in man, in concrete personality, the noblest fruitage of creation. And thus philosophy becomes

the climax of merely intellectual development, furnishing to men the key of self-comprehension as rational and spiritual beings placed in a moral order to act with and upon other creatures of like nature, opening the way to the higher duties of love and worship, and affording for the heart a rest in the Eternal Reason, whose power and godhead are visible in all things created and revealed through the incarnation as Eternal Love. The education that misses the very meaning of existence is a pitiable waste of labor and of life.

PHYSICAL AND MORAL TRAINING.

So far I have spoken of knowledge only. The second great factor in a "liberal" education is found in certain qualifications for conduct, which, as the late Matthew Arnold well said, "is three-fourths of life." It is true that we act in order to know, but it is more profoundly true that we must know in order to act. Conduct is itself an organ of knowledge, and he who has not learned the norms of right living is likely to discover them, but painfully, perhaps, in the penalties attached to violated laws. No man, therefore, is "liberally" educated, in the best sense, without the physical and moral equipment necessary to a healthful and a virtuous life. No institution is qualified to impart a truly "liberal" education, or any education which a sensible parent would covet for his child, unless it takes into account those growths of body and sentiment which, if not sound, are dangerous.

I put the body first because it has a causal relation to the emotional and affectional life. It is now well understood that much of what once passed under the names of vice and crime is simply disease. The study of abnormal psychology reveals the fact that the qualifications for right conduct are largely physical. We cannot fairly assume that youth in college are incapable of choosing their own studies, and at

the same time accord to them the wisdom to maintain, in conditions of health and development, the most complex organism known to science, in the midst of perils and temptations of the most insidious and destructive character. Educators now see that it is an educational duty to impart instruction in practical hygiene as early in the course as possible, and to furnish the best accredited facilities for the most healthful forms of exercise. I believe that the gymnasium and the athletic association, when rightly administered and utilized, are moral agencies of the first order, and a hundred times more effective against rowdism and barbarism than proctors and informers. That these agencies are liable to perversion is undoubtedly true, but for this reason they should be so directed and controlled that they cannot be perverted. The objections most frequently and effectively raised against physical training, as actually conducted in some institutions more famous for muscle than for brains, derive much of their force from its association with a type of paganism which counts bodily well being as the chief end of life, and neglects that culture of the moral and religious sentiments, without which one may, indeed, breed a splendid animal, but cannot educate a man.

Lastly, then, it seems to me that no education is truly "liberal" which leaves the subject of it a mere intellectual and physical force, without eliciting those sentiments of the heart which bind him to his species and his Creator, fit him for the family and society, the Church and the State, and which cannot be developed without the presence in the soul of that "love which is the fulfilling of the law." An education that fails in producing lofty character, sustained and nourished by a pure faith, may, indeed, fill the world with capable and masterly men in their vocations; but unless it can soften the heart of success and open the palm of power, it only strengthens the grasp of greed and misses the making of a noble man. There is higher than earth-born wisdom in those words of the

great Apostle : "Though I speak with the tongues of men and of angels, and have not love, I am become as sounding brass or a tinkling cymbal. And though I have the gift of prophecy and understand all mysteries and all knowledge ; and though I have all faith, so that I could remove mountains, and have not love, I am nothing."

THE DEMAND FOR LIBERAL EDUCATION.

If I have succeeded in making plain my conception of what a "liberal" education is, I am sure it would be superfluous to show that the type of manhood it produces is required in every department of professional and public life. The scholar is needed not only in literature, in science, and in the learned professions, but even more imperatively in politics. It is to be hoped that the days of high-minded statesmanship may not vanish from the earth. The great statesmen of all lands have usually been scholars. Liberally educated men were numerous in that Federal Convention which framed the organic law of our land, and gave to our National Constitution the stamp of wisdom and dignity that has won for it recognition as the greatest political document ever written by the hand of man. It was not the work of specialists, but of great men, and great men are those who most fully represent humanity.

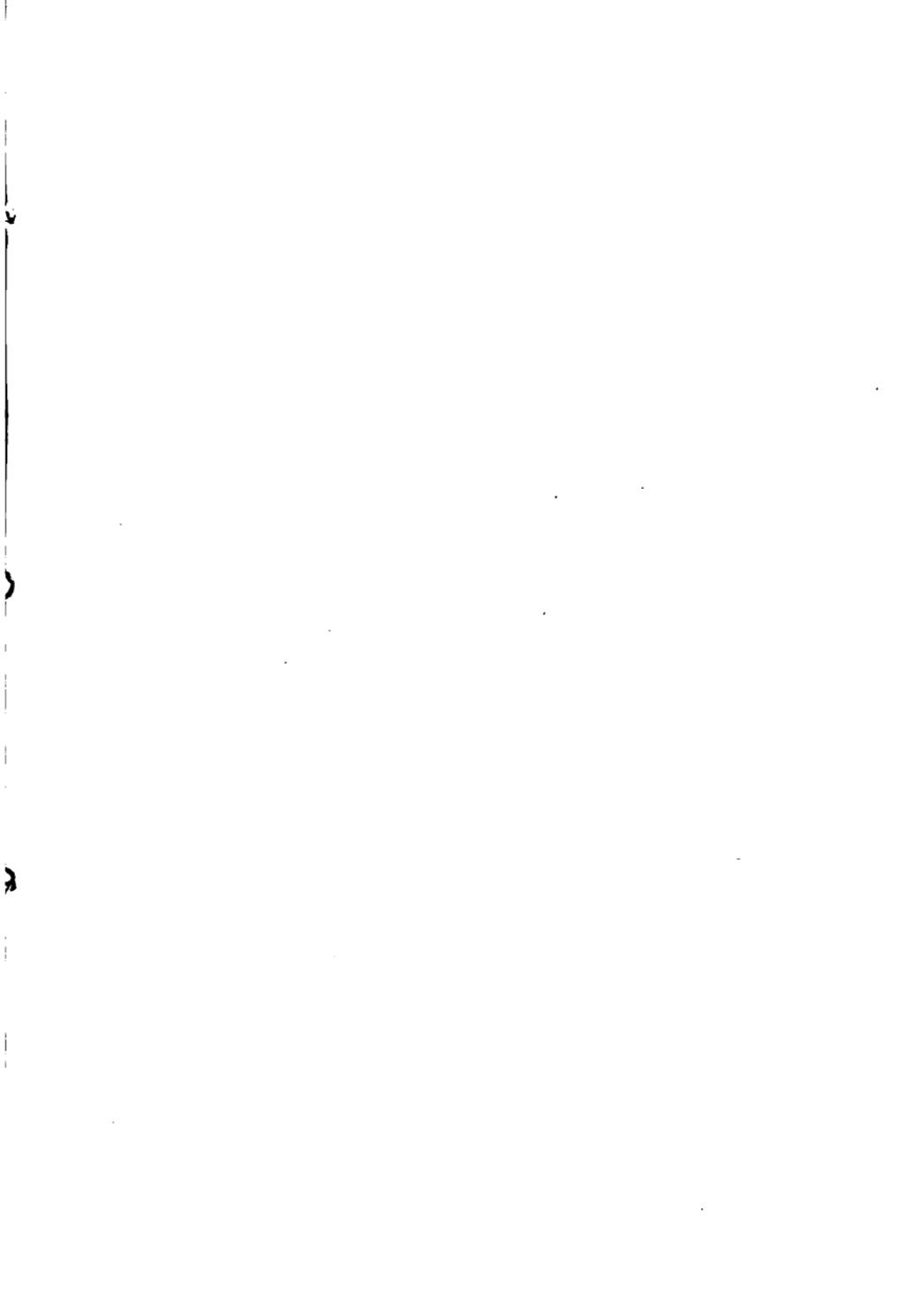
The liberally educated man comes to his speciality, whatever it may be, not only a master of the means and methods of research, but with a spirit of sympathy with other lines of labor and a disposition to apply to his own work the results of collateral knowledge. Nothing is perfectly understood until it is known in its relations to everything else. This is the great principle of the comparative method which has dominated the scientific work of the last half century, with such marvelous results. The best preparation for the specialist is a broad, general culture which lifts him at once from the circumscribed condition

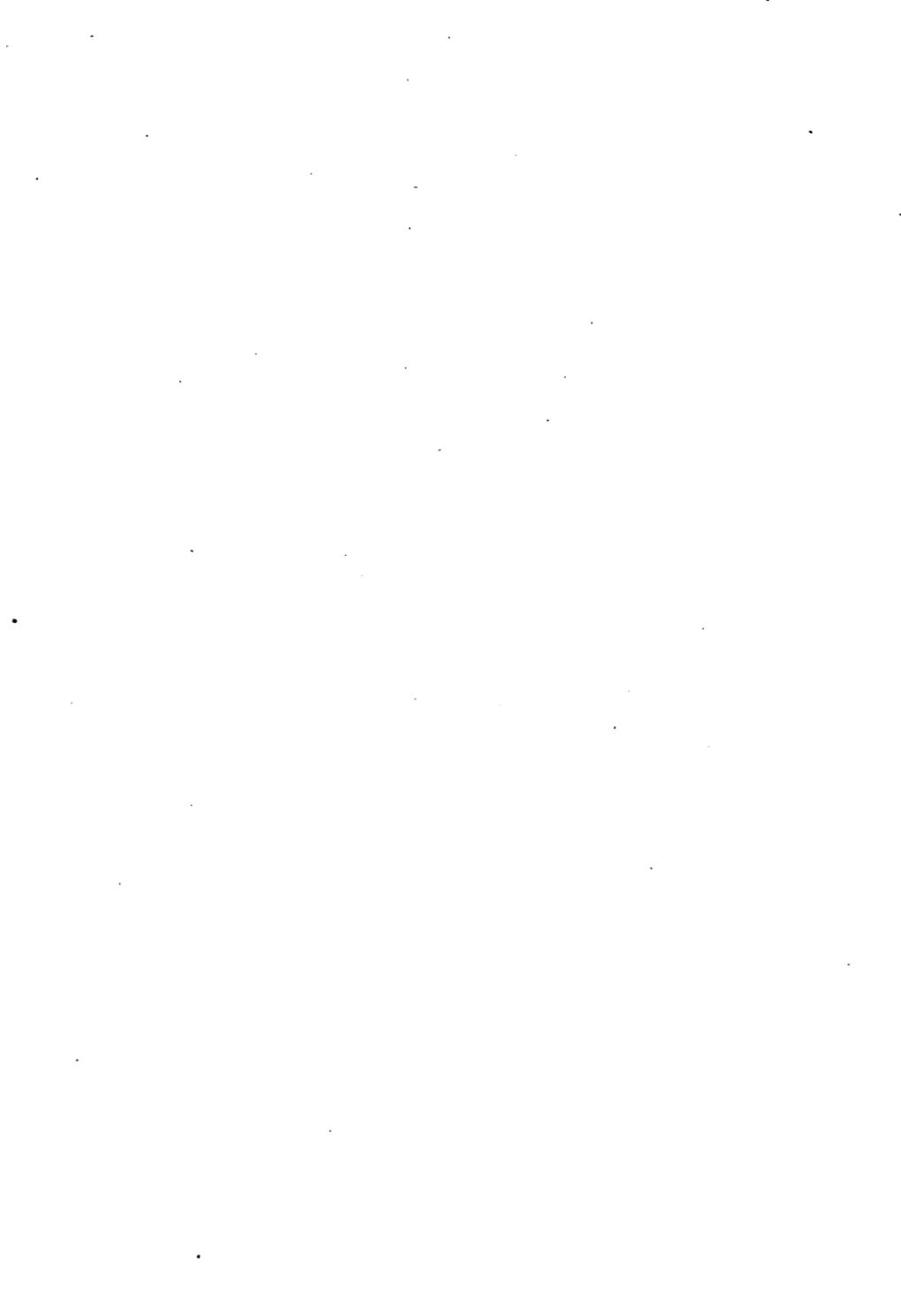
of an intellectual mechanic to the dignity of a philosopher. Nothing so exalts and ennobles a calling in life as the perception of its relations to what lies beyond its own precincts and connects it with the fundamental needs and ideals of humanity. It converts the carpenter into the architect, the politician into the statesman, the chronicler into the historian, the priest into the prophet. It transforms every trade into a profession, every profession into a mastery.

Against all the unquestionable advantages of a "liberal" training there is one strong current of influence which is almost irresistible. It is the practical materialism which has no faith in the supersensuous or the ideal, which cannot wait for remote results, but must walk in the sight of its own defective eyes. It can be forgiven in the very ignorant, but not so readily in those who should be our leaders. And yet, it pervades even our educational circles. It shows itself in the reiterated demand that the graduates of our colleges shall be fitted in the college to earn a living by some practical art without further and special instruction, and in the proposal that the purely cultural studies shall be banished from the curriculum to give place to the arts of clerks and accountants. I mean no disrespect to these, and much more practical knowledge is, indeed, to be recommended to all our youth, but the assumption is often made that the aim of the college should be to train for paying places rather than to promote culture. The heresy is akin to that which regards as the leading attribute of a successful president of a college dexterity as a commercial traveler rather than scholarly attainments.

It can hardly be possible that, in a land of such large resources as ours, liberal culture will ever be so costly a luxury that it must be wholly sacrificed to a hand-to-mouth utilitarianism. Nor can it be that our great financial princes, with their keen and just discernment of values, and others of more modest means, will fail to perceive the worth of such culture

or suffer it to beg or means to sustain its life. On the contrary, I believe that ever-increasing numbers of aspiring young men will ask the question, "Where can we obtain the culture that will give the greatest breadth and altitude to our manhood?" And I believe also that good, wise, and philanthropic men will ever ask this other question, "Where can we best discharge our stewardship as possessors of fortunes by promoting most directly and certainly, not the pursuits of mere self-preservation, to which human instincts sufficiently impel, but the truest and highest intellectual, moral and spiritual progress of mankind?" And the answer to both questions will be, "Where the highest ideals of liberal education prevail and are conserved, where the production of noble manhood is the all-absorbing aim, in the colleges which most loyally adhere to their high mission as moulders of men." And thus will be united, without the solicitations of mere cheapness on the one hand, or the solicitations of mendicancy on the other, the flower of our youth in the pursuit of "liberal" culture and the munificence of wealth in supplying its conditions. Among these centres of light and beneficence, not the least known or the least worthy, may shine in the coming years even more brightly than to-day, our pride and our hope, the University of Rochester!





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